

Conditional Closure Request

Site: Ballfield/Former Landfill, also known as St. George Island Two Party Agreement (TPA) Site 7 and as National Oceanic and Atmospheric Administration (NOAA) Site 7.

Location: St. George Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). TPA Site 7 is located in the southern portion of the City of St. George at 56° 36' 2.08" N latitude, 169° 32' 49.41" W longitude (Figure 2).

Legal Property Description: TPA Site 7 is in Tract 52, Township 41 South, Range 129 West, Section 29 of the Seward Meridian, Alaska, as shown on the plat of rectangular net survey, officially filed February 15, 1985 (Figure 2).

Type of Release: TPA Site 7 is the location of an historic landfill. Known releases from unknown sources consisted of lead and diesel range organics (DRO) contaminated soil located less than two feet below the surface of the landfill cover material.

History and Background: The Ballfield/Former Landfill is owned by the City of St. George. Ownership of this property was transferred from the federal government to the City in the 1980's. Dates and time frames of the former landfill operation, landfill closure and subsequent conversion to recreational use are not documented. Aerial photographs taken in 1948 (landfill active) and 1967 (landfill inactive and covered) show that the landfill was taken out of operation within this time span (NOAA 2003). Consequently, the landfill was closed prior to promulgation of regulatory standards for municipal solid waste landfills. The site is currently used for recreation, and city residents have constructed a basketball court in a portion of the area.

Summary of Site Investigations and Closure Actions

Site Investigations

In 1992, Ecology and Environment, Inc. (E&E) conducted a preliminary assessment of Pribilof Island sites that included interviews of residents and site visits. For TPA Site 7, they recorded concerns about an oily substance occasionally seen seeping from the elevated sides of the ballfield during summer months, and noted metal debris in the area surrounding the site. The assessment report recommended a site investigation with soil and water sampling (E&E 1993).

In 1993, Woodward-Clyde (WC) conducted an environmental assessment that included the removal of three partially buried drums from the landfill area. Two of the drums were found empty, the third contained rusty water (Woodward-Clyde 1994).

In 1994, Woodward-Clyde, conducted an expanded site inspection to determine the lateral extent of the buried landfill waste, search for buried transformers, and determine if contaminants in concentrations above applicable requirements had migrated outside the landfill boundaries. They collected surface and subsurface soil samples from nine test pits, and sediment samples from the drainage area west of the landfill. WC also conducted an electromagnetic search for buried

transformer carcasses. With one exception, inorganic analyses indicated concentrations lied within normal background ranges. One sediment sample had a lead concentration at 140 milligram per kilogram (mg/kg), which is above background, but below the Alaska Department of Environmental Conservation (ADEC) Method Two cleanup level of 400 mg/kg (ADEC 2004). Organic analyses were all below levels of concern with the exception of DRO at two locations. However, chromatogram patterns indicated a biogenic rather than fuel origin for the DRO detected in all soil samples, therefore the report concluded that DRO was not a contaminant of concern. WC did not find any transformers, nor detect any polychlorinated biphenyl (PCB) in any collected samples. Woodward-Clyde recommended no further action be taken at TPA Site 7 (Woodward-Clyde 1995).

In 1997, based on the Woodward-Clyde findings, NOAA requested and ADEC granted a “No Further Action Site” designation for the Ballfield/Former Landfill Site (ADEC 1997).

In 1998, under contract to the St. George Tanaq Corporation, Polarconsult Alaska, Inc. (Polarconsult) excavated a test pit and installed a shallow well point within the former landfill boundaries. Field notes taken during the pit excavation do not mention detection of petroleum odor or staining, and they took no soil samples. Analysis of a well water sample returned a DRO concentration of 3.2 milligram per liter (mg/l), which is above the ADEC groundwater cleanup criterion of 1.5 mg/l (ADEC 2004). Polarconsult recommended additional site investigation to further characterize contamination nature and extent (Polarconsult 1998).

In 1999, the St. George Tanaq Corporation presented the Polarconsult data to the St. George Restoration Advisory Board. ADEC, after review of the data, reopened the site, as allowed by provisions of the TPA, and requested additional site characterization (ADEC 1999).

In 2000, Columbia Environmental Sciences, Inc. (CESI) conducted a site reconnaissance and noted a strong chemical/petroleum odor near a leachate pool, a strong sheen, and some sediment and vegetation covered with and orange-red stain (CESI 2001).

In 2001, Tetra Tech EM, Inc. (Tetra Tech) conducted a site investigation during which they advanced 21 test borings to refusal within the landfill, and installed five monitoring wells around the landfill. Tetra Tech collected soil and perched water samples from the borings; sediment and surface water samples from the drainage area south and west of the landfill; and groundwater samples from the wells. They analyzed soil and sediment samples for metals, gasoline range organics (GRO), DRO, residual range organics (RRO), pesticides, PCBs, and volatile and semi-volatile organics (VOC and SVOC). Water samples were analyzed for GRO, DRO, VOC, SVOC, and metals. Additionally, Tetra Tech collected background soil samples from six undeveloped locations on St. George Island to determine natural background metal concentrations. Analytical results indicated nearly all contaminant concentrations lied within natural background ranges and/or below regulatory cleanup levels. However, Tetra Tech found DRO and lead concentrations above cleanup levels in soil and perched water at several sample locations; and methylene chloride, a common laboratory contaminant, was detected in a single perched water sample (Tetra Tech 2003).

Tetra Tech detected DRO at four soil core locations, at sample depths greater than six feet below ground surface (bgs). At one core location, TPA7-GP21 (Figure 3), DRO was detected in soil at a concentration of 6,500 mg/kg within the two to eight foot bgs sample interval. Tetra Tech also detected DRO in water above the ADEC groundwater cleanup level in perched water samples taken from three soil core locations within the landfill (Tetra Tech 2003).

At TPA7-GP18 (Figure 3), Tetra Tech detected lead in soil at 444 mg/kg in the soil sample interval zero to two feet bgs. Lead was also detected at concentrations of up to 0.439 mg/l, which is above the ADEC groundwater criterion of 0.015 mg/l (ADEC 2004), in perched water samples from three soil core locations within the landfill (Tetra Tech 2003). Lead at 168 micrograms (μg)/L (total) was detected in one leachate (surface water) sample. However, the surface water quality criterion for lead is based on a particular site's water hardness, and is assessed in terms of dissolved lead (ADEC 2002a, ADEC 2003b). Therefore, the ADEC surface water quality criterion is not applicable to the total lead result obtained from the leachate sample.

Tetra Tech found methylene chloride at 8 μg /l in a single perched water sample; the cleanup level is 5 μg /L. Methylene chloride, a common laboratory contaminant, was not detected in any other soil or water samples.

Tetra Tech's report recommended adding two feet of cover material over the former landfill area, and monitoring for DRO and lead in leachate seeps and groundwater (Tetra Tech 2003).

From 2001 through 2004, groundwater samples were drawn from monitoring wells TPA7-MW-1 through TPA7-MW-5 (Figure 4). Analytical testing found all potential inorganic and organic contaminants below detection levels and/or below ADEC groundwater cleanup criteria (TTEMI 2005).

In 2004, Tetra Tech performed 4-hour (acute lead criterion) and 4-day (chronic lead criterion) composite sampling at three leachate seeps along the perimeter of the landfill (Figure 4). In accordance with ADEC requirements for surface waters (ADEC 2002a, ADEC 2003b), samples were analyzed for total aromatic hydrocarbons (TAH), total aqueous hydrocarbons (TAqH), and dissolved lead as a function of water hardness. Analytical results indicated all samples met water quality standards for growth and propagation of fish, shellfish, other aquatic life, and wildlife (TTEMI 2005).

Final Corrective Actions

In response to Tetra Tech's site characterization report (ADEC 2002b, Tetra Tech 2003), ADEC requested that NOAA ensure that the final landfill area cover was:

- at least 2 feet thick,
- graded to promote drainage without erosion, and
- treated in a manner appropriate to the anticipated, future long-term use of the site.

These landfill cover criteria conform to ADEC's requirements for closure of a Class III Municipal Solid Waste Landfill (ADEC 2003a). ADEC also requested limited source removals of the near-surface DRO contaminated soil found at sample location TPA7-GP21, and the near-surface lead contaminated soil found at sample location TPA7-GP18 (Figure 3).

NOAA incorporated ADEC's requests in the TPA Site 7 Corrective Action Plan (NOAA 2003). NOAA began the final corrective actions on November 4, 2003, by first removing non-NOAA related debris such as scrap rebar, dilapidated bleacher risers and seats, a broken ping pong table, and other miscellaneous junk. NOAA contracted for hauling this debris to either the "Grey Pit" scrap pile or to the municipal landfill, if non-metal. The Grey Pit is an area located near the municipal landfill where auto bodies and other non-combustible debris are staged for future barging off-island or encapsulation (NOAA 2005a).

On November 5 and 6, 2003, NOAA removed approximately five cubic yards (CY) of lead contaminated soil from landfill sample location TPA7-GP18 (Figures 5 and 6). The contaminated soil was placed directly into supersacks, which were labeled, sampled for RCRA characterization, and stored for future off-island disposal. Six soil samples were taken from the excavation for field screening using a commercial test kit (Hybrivet Systems "Lead Check For Soil"). Field screening results indicated no lead concentrations above 400 mg/kg within the excavation. Two lead confirmation samples plus a duplicate were taken for fixed lab analyses. A perforated liner was installed and the excavation backfilled with clean material (NOAA 2005a).

On November 6, 2003, NOAA removed approximately 5 CY of DRO contaminated soil from landfill sample location TPA7-GP21 (Figures 5 and 7). However, after removal of the initial two bucket loads and their placement into a dump truck, NOAA observed a blue tile at about 2 feet bgs. Treating the tile as potential asbestos containing material (ACM), all subsequent dirt and tile was loaded into supersacks. The initial two PCS bucket loads were inspected and found free of tile, and the PCS was taken to the NOAA Petroleum-Contaminated Soil Stockpile (Figure 1). Metal drums were encountered further down in the excavation; after determining the drums were empty, they were removed as necessary and transported to the "Grey Pit". At four and one half feet bgs, NOAA encountered the perched water table and stopped further excavation work. Three confirmation samples plus a duplicate were taken in the excavation. The supersacks were stored for future off-island disposal. A perforated liner was installed and the excavation backfilled with clean material (NOAA 2005a).

Analyses of the three confirmation samples collected from the lead hot spot excavation (Figure 6) indicated a total lead concentration at 738 mg/kg in a sidewall sampling location, and 220 mg/kg at the bottom of the excavation. Analyses of the four confirmation samples collected from the DRO hot spot excavation (Figure 7) indicated non-detection of DRO, BTEX, and select PAHs. (NOAA 2005a).

Landfill cap improvement activities took place from November 6 to November 13, 2003. A Tetra Tech engineer placed grade stakes throughout the cover installation area to aid in control of final cover depth. NOAA improved the original landfill cap by placing a minimum of six inches of

scoria atop the historic cap to bring cap thickness to at least the State minimum standard of two-feet, including over the area with an elevated lead level found in the excavation sidewall. Also, NOAA placed sand in low spots (in some areas up to three feet thick) prior to placing the six-inch scoria lift. NOAA mitigated precipitation infiltration by compacting and sloping the cap to direct runoff to the periphery of the landfill, which is channeled to mitigate leachate emanating from the landfill. Cover material was placed and compacted to raise the ballfield surface to the level of the basketball court's concrete slab, which further mitigates infiltration. Approximately 1,030 CY of clean fill and cover material were placed, contoured and compacted at the site (NOAA 2005a). On the south side of the site, NOAA applied approximately ten cubic yards of scoria to create a ramp to a preexisting walkway made of wooden pallets that lead to housing on the south side of the marsh. Figure 5 shows the locations of the contaminated soil excavations, and final surface contours.

Conclusions and Recommendations:

Conclusions: TPA Site 7, a historic community landfill, was closed sometime prior to 1967, before regulatory control over landfill creation and closures. Site investigations found that most of the landfill footprint had at least two feet of cover material over the buried debris. However, investigations also found two locations in the northeastern portion of the landfill with DRO and lead contaminated soil less than two feet below the surface of the landfill.

NOAA excavated the DRO contaminated soil location. Confirmation sample analyses demonstrated that remaining soil had DRO, BTEX and select PAH concentrations below analytical detection levels.

NOAA also excavated the lead contaminated soil location. Field screening results indicated that remaining lead concentrations were below 400 mg/kg. While confirmation sample analyses found lead at a maximum concentration of 738 mg/kg in the excavation sidewall, a minimum of two feet of contoured and compacted capping material was subsequently installed over this location.

Groundwater and leachate analytical results show infiltration is not causing contaminants to migrate from the landfill in concentrations above applicable ADEC requirements (Tetra Tech 2005). In accordance with NOAA's long-term groundwater monitoring plan (NOAA 2005b) as approved by ADEC (ADEC 2005), the monitoring wells associated with TPA Site 7 were decommissioned in September 2005. Further, the approved plan suspends the need for further leachate sampling.

Although use of this site as a landfill was halted prior to promulgation of solid waste regulations, NOAA has substantially met the requirements of 18 AAC 60.390 (Closure Standards for a Class III Municipal Solid Waste Landfill) by ensuring the final cover material is at least 24 inches thick, has been graded to promote drainage without erosion, and has been treated in a manner appropriate to the anticipated, future long-term use of the site.

NOAA submitted a Post Closure Monitoring Plan to ADEC Division of Environment Health, Solid Waste Program (Appendix F of NOAA 2005a, submitted July 7, 2005). The Plan includes:

- a five-year program of visual monitoring of the integrity of the landfill cover material;
- NOAA's intent to record a notice with the property deed identifying the location of the landfill, and;
- NOAA's submission of an inspection summary report to ADEC at the end of the post-closure monitoring period describing the site conditions.

NOAA has mitigated the potential for inadvertent exposure to the contaminants remaining in the landfill, further excavation of this site is not warranted.

Recommended Action: In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate and corrective action, to the maximum extent practicable, at the Ballfield/Former Landfill, TPA Site 7/NOAA Site 7 in accordance with the Agreement and that ADEC grant a conditional closure not requiring further remedial action from NOAA. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

References:

ADEC 1997. Letter from Mr. Ray Dronenburg (ADEC) to Ms. Mary Moloseau-Goetz (NOAA Pribilof Project Office) Regarding Approval for Closure Request for St. George Island, Former Landfill/Ballfield Site. September 15, 1997.

ADEC 1999. Letter from Mr. Louis Howard (ADEC) to Mr. John Lindsay (NOAA Pribilof Project Office) Regarding Reopening of a Closed Site: Ballfield/Former Landfill Two Party Agreement Site No. 7, St. George Island, AK. October 25, 1999.

ADEC 2002a. *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances*. State of Alaska. Amended through August 2002.

ADEC 2002b. Letter from Mr. Louis Howard (ADEC) to Mr. Greg Gervais (NOAA Pribilof Project Office) Regarding Draft Site Characterization Report: Ballfield/Former Landfill TPA Site No.7 St. George Island October 1, 2002. December 31, 2002.

ADEC 2003a. Title 18 Alaska Administrative Code (AAC) Chapter 60. Solid Waste Management. State of Alaska. Amended through August 8.

ADEC 2003b. *Title 18 of the Alaska Administrative Code 70 (18 AAC 70), Water Quality Standards*. State of Alaska. Amended through June 26, 2003.

ADEC 2004. *18 AAC 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through May 26, 2004.

ADEC 2005. Letter from Mr. Louis Howard (ADEC) to Mr. John Lindsay (NOAA Pribilof Project Office) Regarding Draft Long Term Monitoring Plan, St. George Island, Alaska June 30, 2005. File Number 2644.38.007. August 8, 2005.

CESI 2001. *Draft Site Reconnaissance Report St. George Island, Alaska*. Columbia Environmental Sciences, Inc., Kennewick, Washington. February 2001.

E&E 1993. *Preliminary Assessment of National Oceanic and Atmospheric Administration Sites, Pribilof Islands, Alaska*. Ecology and Environment, Inc., Anchorage, Alaska. February.

NOAA 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*, Attorney General's Office File No. 66 1-95-0126. January 26.

NOAA 2003. *Final Corrective Action Plan For Two Party Agreement Site Number 7. Pribilof Islands Environmental Restoration Project*. August 2003.

NOAA 2005a. *Final Corrective Action Report, TPA Site 7/NOAA Site 7 – Ballfield/Former Landfill, St. George Island, Alaska*. July 19.

NOAA 2005b. *Final Long-Term Groundwater Monitoring Plan, St. George Island, Alaska, Pribilof Islands Environmental Restoration Project.* August 29.

Polarconsult 1998. Polarconsult Alaska, Inc. letter to the St. George Tanaq Corporation regarding environmental site assessment activities; dated April 3, 1998.

Tetra Tech 2003. *Final Site Characterization Report Ballfield/Former Landfill, Two-Party Agreement Site No. 7.* Tetra Tech EM Inc., Mountlake Terrace, Washington. July 11.

Tetra Tech 2005. *Final Field Investigation Report, Pribilof Environmental Restoration Project, St. George Island, Alaska.* Tetra Tech EM Inc., Mountlake Terrace, Washington. June 23.

Woodward-Clyde 1994. *Phase 1B Environmental Assessment St. George Island, Alaska.* Prepared by Woodward-Clyde for U.S. Army Corps of Engineers, Seattle District. Final report March 1994.

Woodward-Clyde 1995. *Expanded Site Inspection, St. George Island, Alaska.* Prepared by Woodward-Clyde for U.S. Army Corps of Engineers, Seattle District. Final report March 1995.

Conditional Closure Request
Ballfield/Former Landfill
TPA Site 7/NOAA Site 7
St. George Island, Alaska

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

Date

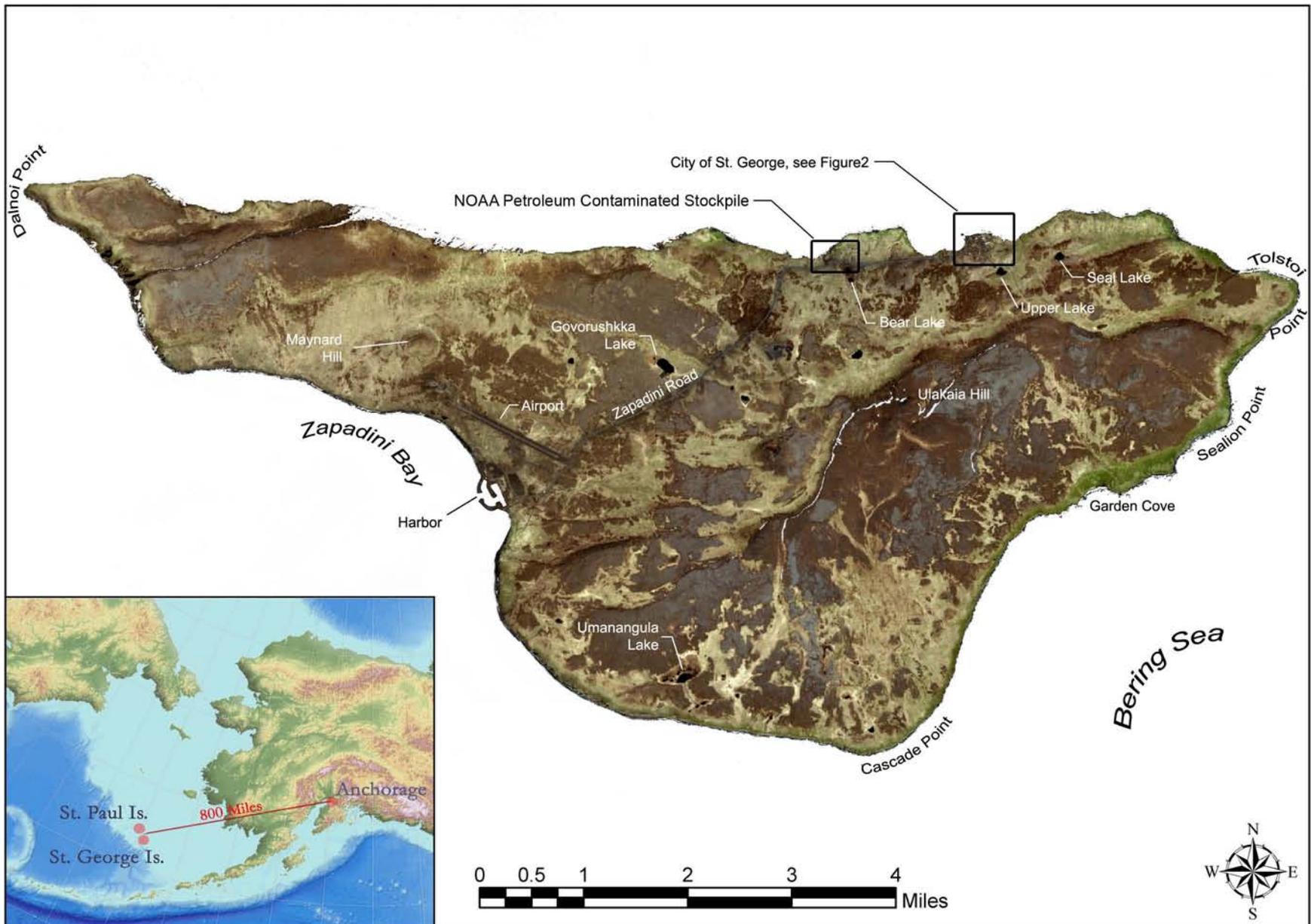
Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Ballfield/Former Landfill, St. George TPA Site 7/NOAA Site 7, in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

Date

Figures



Figure

1

Island Vicinity Map
Ballfield/Former Landfill
TPA Site 7/NOAA Site 7
St. George Island, Alaska

Source: Ikonos 2001 Satellite Image

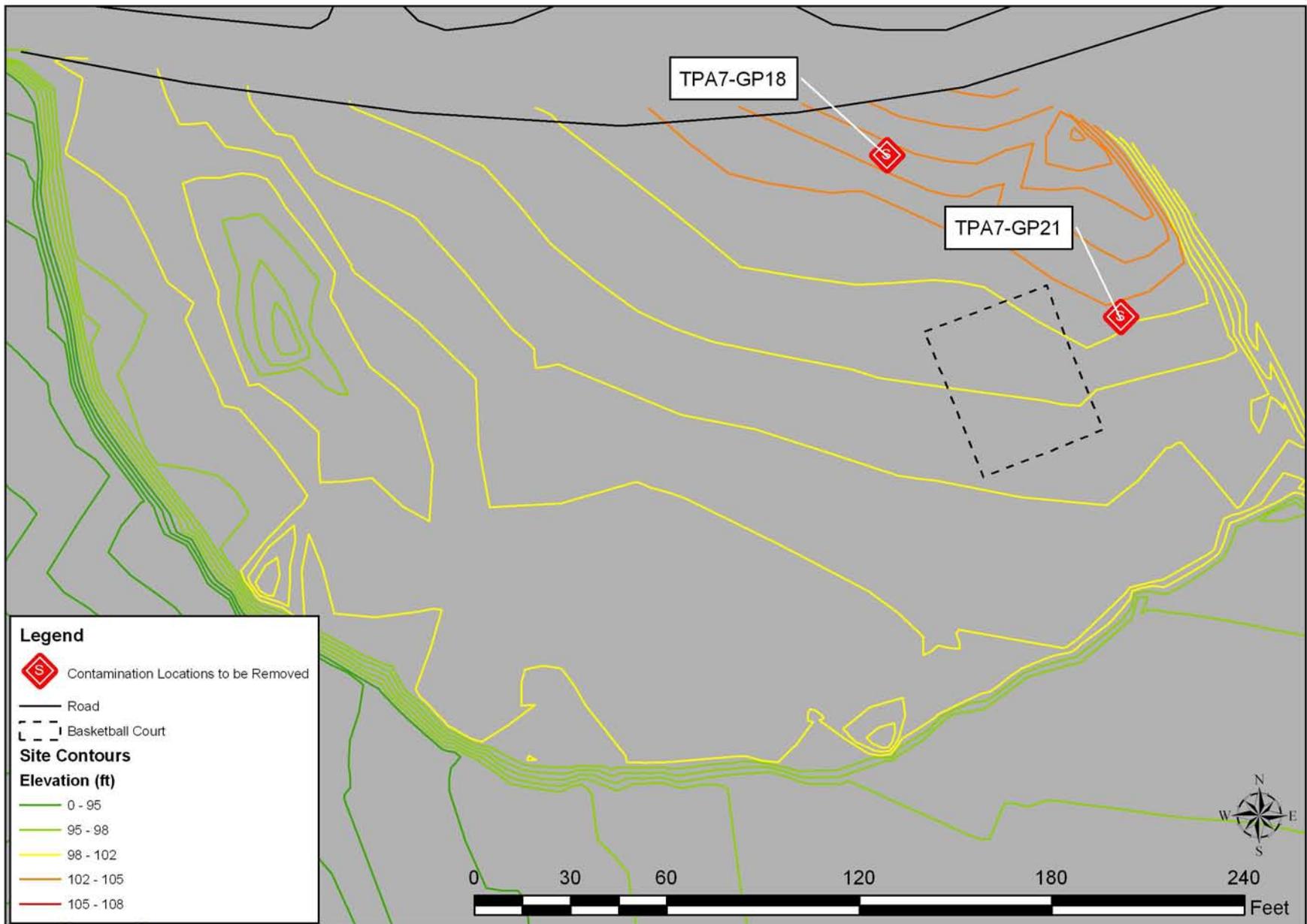




<p>Figure 2</p>	<p>Legal Property Description Map Ballfield/Former Landfill TPA Site 7/NOAA Site 7 St. George Island, Alaska</p>	<p>Source: AeroMap U.S. 9/28/96 Aerial Photograph, Bureau of Land Management Land Survey Filed February 15, 1985</p>
---------------------	---	--



Text



Figure

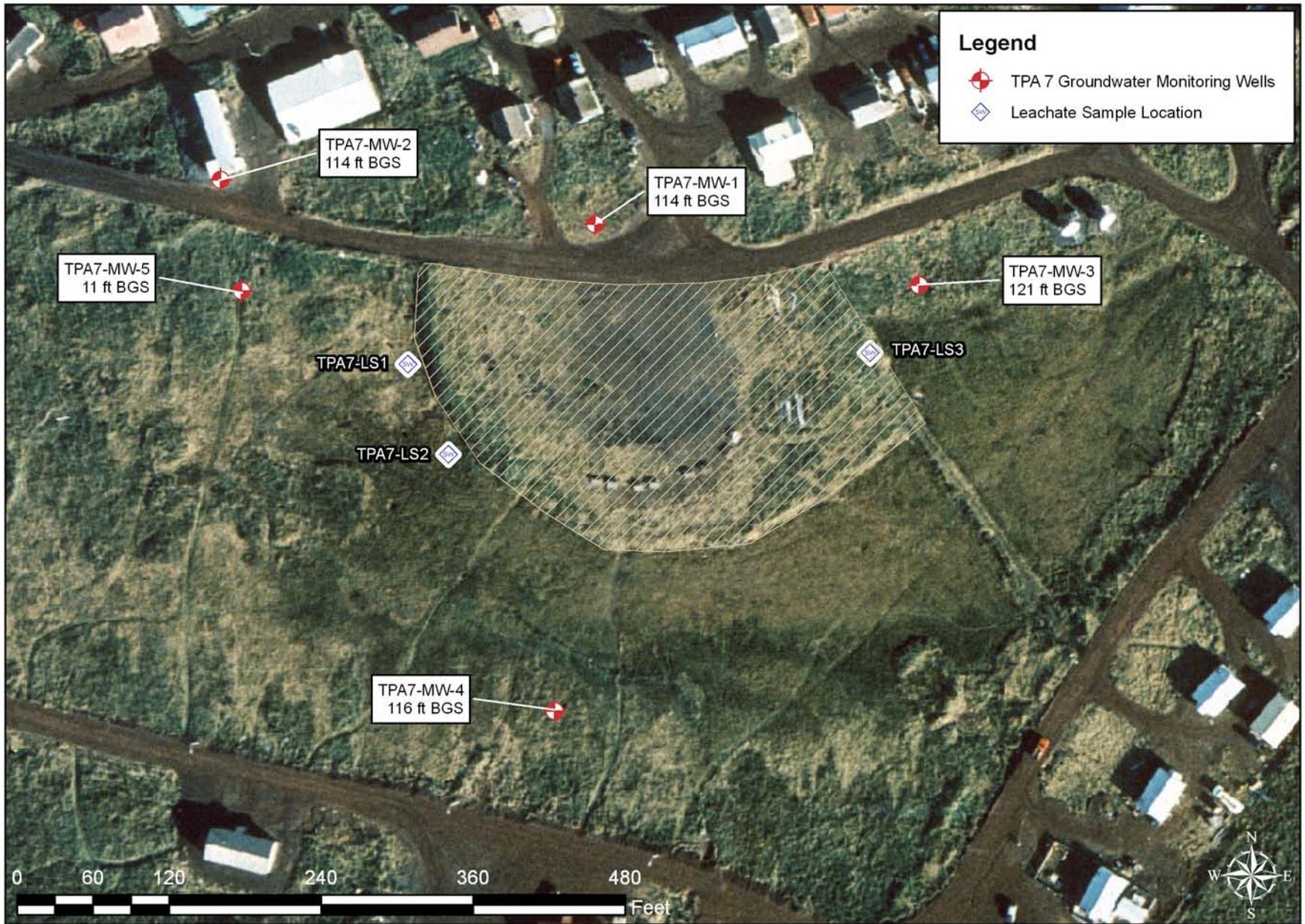
3

Site Conditions Prior to Corective Action
Ballfield/Former Landfill
TPA Site 7/NOAA Site 7
St. George Island, Alaska

Source: Pribilof Project Database

Note: Contours in Feet Above Mean Sea Level.





Figure

4

**Groundwater & Leachate
Sampling Locations
Ballfield/Former Landfill
TPA Site 7/NOAA Site 7
St. George Island, Alaska**

Source: AeroMap U.S. 9/28/96 Aerial
Photograph; TTEMI Draft Field
Investigation Report, April 26, 2005



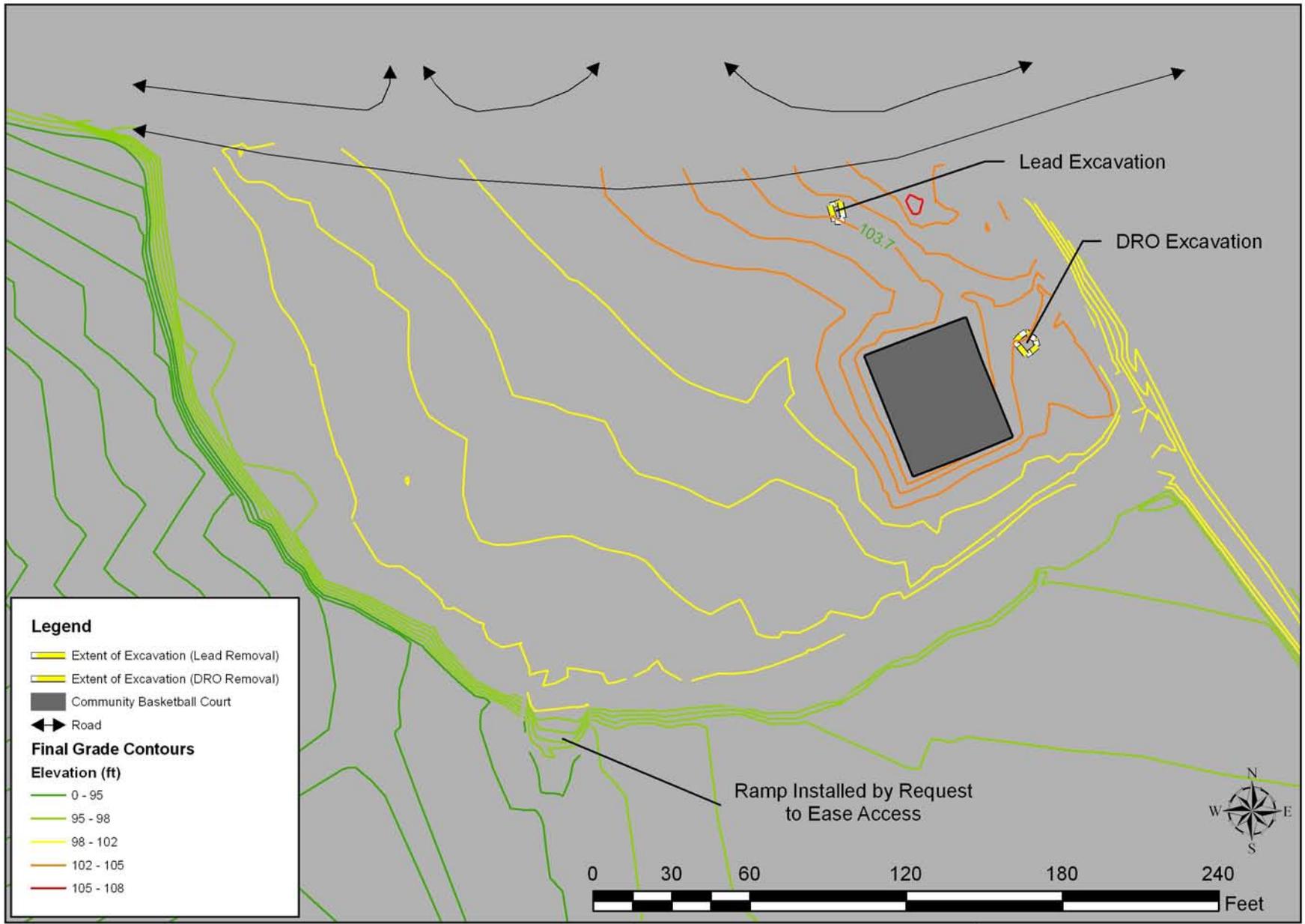
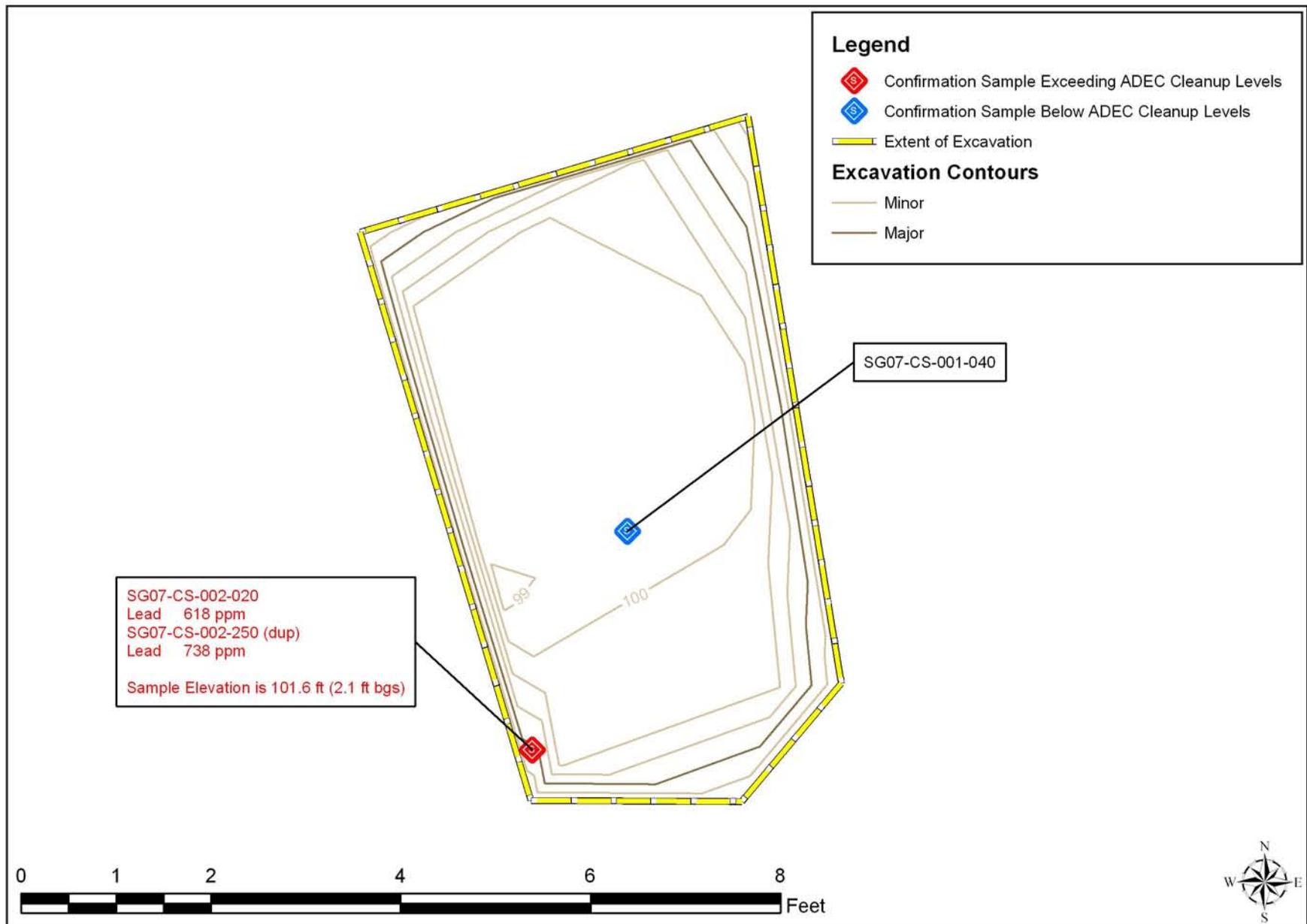


Figure
5

Site Conditions After Corrective Action
Ballfield/Former Landfill
TPA Site 7/NOAA Site 7
St. George Island, Alaska

Source: Pribilof Project Database
 Note: Contours in Feet Above Mean Sea Level.





Figure

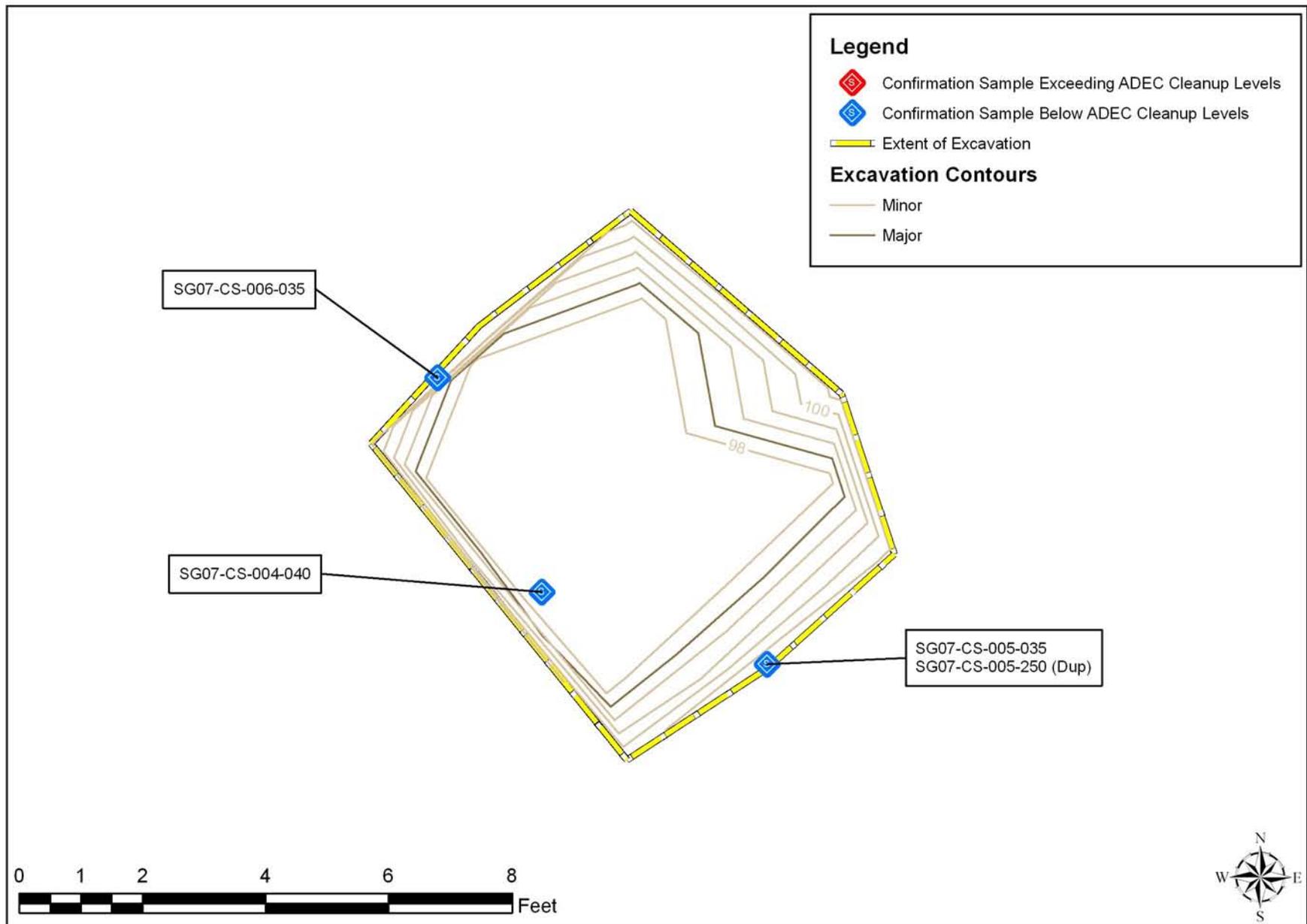
6

**Lead Excavation
Ballfield/Former Landfill
TPA Site 7/NOAA Site 7
St. George Island, Alaska**

Source: Pribilof Project Database

Note: Contours in Feet Above Mean Sea Level. Below ground surface (bgs).





Figure

7

**DRO Excavation
Ballfield/Former Landfill
TPA Site 7/NOAA Site 7
St. George Island, Alaska**

Source: Pribilof Project Database

Note: Contours in Feet Above
Mean Sea Level.

